EXAMINATION OF CAN DOUBLE SEAM

Aim: To examine the quality of can double steam

Introduction: A seam is that portion where two metal parts are joined into an integral unit. ***'Seaming'*** is the operation of combining the two metal parts into an integral unit. ***'Double seaming'*** is an operation in which the curl of the lid containing rubber compound and the flange of the can body are hooked, rolled and pressed by machine, in two successive operations, so that an airtight joint is formed.

The efficiency of the seam depends on the mechanical perfection of the two interlocking hooks formed during the seaming operation, plus the presence of a thin film of lining compound.

The double seam of a can should be examined very carefully because successful canning depends largely on the degree of perfection achieved in sealing the container airtight. The finished seam should be judged in it entirely and not by individual measurements of its elements. Both external and internal conditions of the double seam should be visually inspected as measurements taken, before arriving at any conclusion.

Equipments:

1) Micrometer screw gauge (2) Seam cutting saw. (3) Cutting pliers. (4) Magnifying glass. (5) Double-seamed cans (2-3 per student)

Procedure:

a) External Examination (Non-destructive):

i) **Visual:** Observe carefully all around the seamed end, both on the body and lid sides. Note any peculiarities or presence of defects such as **'Vees', 'Lips', 'Cut overs', 'Lined Seam', 'spurs', 'jumped seam' and 'false seam' etc.** Give special attention to the part of the double seam over the side lap joint.

ii) **Measurements:** Using the screw gauge, take measurements of seam length or width (W), seam thickness (T) and countersink (CS), at 3 points on can end separated radially by 120^0 angle, avoiding the side seam (or at 4 points separated by 90^0). Record the measurements.

b) Internal Examination (Destructive):

i) **Visual:** Strip one can end all round by means of the pliers and get a ring of the cover hook portion. Observe the wave-like ***'wrinkles'*** on the inside surface of cover hook. Rate the wrinkles. In the other can, cut seam sections from 3 or 4 points, where external

measurements had been taken. Observe the cut sections for hooking, overlap and clearances, using the magnifying glass.

ii) **Measurements:** Separate the body hook (BH) and the cover hook (CH) without straightening either, and measure their lengths. Taking average values for hook lengths and tin plate thickness (t), calculate the overlap percentage (OL%) of the double seam for each can tested, using the following formula.

$$OL\ \% = \frac{BH + CH + t - W}{W - 3t} \times 100$$

Where,

BH, CH = Body hook, cover hook

t = Tin plate thickness

W = Seam length or height or width

OL = overlap

Compare the results with standard values.

Observations:

The measurements of double seam elements may be tabulated in the following Proforma.

Can No. & End	Seam cutting points	External measurements			Internal Measurements			Remarks
		W	T	CS	BH	CH	OL%	
No. 1 (Top)	1 2 3							
	Average							
No. 2	1 2 3							
	Average							

Tin plate thickness: Wrinkle Rating:

Note:

The overlap percentage should be greater than 45% for square or oval cans (irregular cans)

At the side seam: Irregular cans OL% not < 40

Round cans OL% not < 45

See Appendix for standard measurements of double seam and wrinkle rating.

Common Seam Defects and their Causes:

Defects	Causes
Cut-over	(a) Chuck set too low in respect to rollers b) Chuck worn-out (c) Rollers worn-out (d) Slip between cover and chuck. (e) Too much solder on the side seam. (f) Rollers set too tight. g) Vertical play in seaming head too great. (h) First or second operation roll set too tight (i) Excessive solder in the side seam.
False Seam	(a) Covers too tight for cans. (b) Too much flange on can (c) Damaged end curl. (d) Incorrect scanner chuck. (e) Incorrect Seamer setting.
Lips	(a) TI Roller too tight. (b) Excessive lifter pressure (c) Worn I operation roller (d) Loose I operation roller.
Deep Counter sink	a) Too much lifter pressure. (b) Chuck set too low (c) Chuck flange too wide (d) Cover fitting chuck too tightly. (e) Vertical play in seaming head permitting rollers to rise up from chuck. (f) Base plate setting not parallel with chuck or worn more on one side than the other, causing uneven countersink (deeper on one side).
Shallow countersink	Chuck flange being worn.
Short cover hook	a) Short covers (b) Countersink too deep (c) Loose I operation roller not turning sufficient cover stock into the seam (d) Loose II operation roller which will not flatten the cover hook out to

	its full length.
Long Cover hook	a) Shallow countersink (b) Not enough lifter pressure
Short can hook	(a) Not enough lifter pressure (b) First operation roller too light, (c) Second operation roller too loose.
Long can hook	May be caused by too much lifter pressure.
Wrinkled I seam	Loose or worn I operation roller
Wrinkled II seam	Loose or worn II operation roller
Loose I seam	Loose or worn I operation roller
Loose II seam	Loose or worn II operation roller
Wide II seam	(a) Loose first operation roller allowing second operation roller to flatten down too much seam. (b) II operation roller too tight, allowing it to flatten seam too much (c) Too much lifter pressure (d) Worn II operation roller.
Narrow II seam	(a) Countersink too deep, taking stock for counter sink which should go into seam (b) Loose II operation roller not pressing seam down full width (c) Tight first operation roller making I seam too hard.
Lined Seam	Worn or scored second operation roller.
Cut Seam:	(a) Excessive lifter pressure (b) Chuck set too low in relation to rollers, (c) II operation roller too tight (d) Too much solder on side seam (e) Can slipping or spinning on chuck.
Fractured or polished seam	(a) Seaming rollers slipping (b) Flat spots on rollers (c) Lack of lubrication (d) Rollers being set too tight.
Partial false Seamer knock downs	(a) Cannot centering on chuck (b) Flanges on can bent down (c) Damaged cans (d) Dented or damaged covers.

Skidder	(a) Incomplete seam formation as a result of chuck skid or slip during second operation seam formation (b) Insufficient base plate pressure (c) Seaming rolls not rotating freely (d) Worn Seaming chuck (e) Oil or grease on chuck.